Refine Search

Search Results -

Terms	Documents
L5 and separation and activated carbon	25

Database:
US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Search: L6

Refine Search | Recall Text | Clear | Interrupt

Search History

DATE: Thursday, April 20, 2006 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=USPT; PLUR=YES; OP=ADJ			
L6	L5 and separation and activated carbon	25	L6
L5	guanidine and melamine	2533	L5
L4	L2 and remove?	0	L4
DB=JPAB; PLUR=YES; OP=ADJ			
L3	L2 and activated carbon	1	L3
L2	guanidine and melamine	63	L2
L1	guanidine compound and activated carbon	2	L1

END OF SEARCH HISTORY

L2: Entry 1 of 1 File: USPT Sep 14, 2004

DOCUMENT-IDENTIFIER: US 6790934 B2
TITLE: Method for purification of aromatic polyethers

Brief Summary Text (47):
Also present in the polymer-containing mixture is at least one phase transfer catalyst, which in various embodiments is substantially stable at the temperatures employed; i.e., in the range of about 125-250.degree. C. Various types of phase transfer catalysts may be employed for this purpose. They include quaternary phosphonium salts of the type disclosed in U.S. Pat. No. 4,273,712, N-alkyl-4-dialkylaminopyridinium salts of the type disclosed in U.S. Pat. Nos. 4,460,778 and 4,595,760, and guanidinium salts of the type disclosed in the aforementioned U.S. Pat. No. 5,229,482. In some embodiments the phase transfer catalysts, by reason of their exceptional stability at high temperatures and their effectiveness to produce high molecular weight aromatic polyether polymers in high yield, comprise the hexaalkylguanidinium and alpha,omega-bis(pentaalkylguanidinium)alkane salts, particularly the chloride salts. In a particular embodiment the catalyst is 1,6-bis(penta-n-butylguanidinium)hexane dibromide. In another particular embodiment the catalyst is hexaethylguanidinium chloride.

Brief Summary Text (74):
In a particular embodiment a polymer mixture comprises (i) an aromatic polyetherimide, (ii) hexaethylguanidinium chloride catalyst, (iii) sodium chloride, and (iv) o-dichlorobenzene. Water is provided in the prescribed amounts and the temperature of the ODCB phase is raised to a temperature in some embodiments between the boiling point of water and the boiling point of ODCB under the prevailing pressure, in other embodiments to at least 110.degree. C., in still other embodiments to a temperature between about 110.degree. C. and the boiling point of ODCB under the process conditions and in still other embodiments to a temperature between about 120.degree. C. and the boiling point of ODCB under the process conditions (wherein the normal boiling point of ODCB is 180.degree. C. at one atmosphere pressure). Alternatively, the polymer-containing mixture can be heated under partial vacuum, in which case the temperature may also be less than 110.degree. C. as well as in the ranges given above. Any ODCB that escapes with the steam may be recovered using conventional means. In the process of water evaporation sodium chloride dissolved in the aqueous phase may recrystallize, and the crystallites grow in size, and form agglomerates so that they may sediment to the bottom of the tank when stirring is stopped. For instance, the initial size of sodium chloride crystals produced during a typical polyetherimide polymerization may typically be in the range of about 0.5 to about 20 .mu.m in diameter in an ODCB phase. The agglomerates are typically larger in size than any crystallites or agglomerates that may be present before an evaporation step. A portion of residual sodium chloride is now typically in a form that can be filtered. The polymer mixture is filtered using known methods. The ODCB permeate from filtration may be subjected to further purification steps and/or sent to equipment for recovery of polyetherimide from organic solvent. The filter cake itself may be treated to recover any entrained polyetherimide and other valuable species by standard techniques, such as by extracting with ODCB.

Brief Summary Text (82):
Suitable adsorption media include, but are not limited to, alumina, silica, clay, montmorillonite, zeolite, charcoal, diatomaceous earth, fuller's earth, commercial filter agents such as CELITE, and other media typically employed in adsorption chromatography. In general higher surface area adsorbents (for example as represented by higher mesh numbers relating to smaller particle size) are more efficient in adsorbing the desired species. In a particular embodiment a polyetherimide reaction mixture in ODCB may be contacted with an appropriate adsorption medium to adsorb essentially all or a portion of soluble species (other than polyetherimide) such as ionic catalyst species, such as hexaethylguanidinium chloride. In a particular embodiment the adsorption medium is silica. The treated mixture can then be filtered one or more times to remove essentially all or a portion of insoluble alkali metal halide (such as sodium chloride) and adsorbed catalyst species on the medium. In alternative embodiments substantially all or at least a portion of alkali metal halide (such as sodium chloride) may be removed before treatment of the polymer-containing solution with a solid adsorption medium. In the present context substantially all the alkali metal halide means greater than about 90 wt. % alkali metal halide.

Detailed Description Text (2):
A polyetherimide was prepared in o-dichlorobenzene through the reaction of bisphenol A disodium salt and 1,3-bis[N-4-chlorophthalimido]benzene in the presence of hexaethylguanidinium chloride catalyst (HEG). The polymer-containing mixture was quenched at 120.degree. C. with glacial acetic acid and diluted to about 15% solids (wt. polymer/wt. polymer+wt. solvent) through addition of more o-dichlorobenzene. The mixture (about 10 liters; about 13 kilograms) was washed with about 4.1 kilograms water (3:1 organic:aqueous) at a temperature of about 85-90.degree. C. and fed to a liquid/liquid continuous centrifuge at about 90.degree. C. at different rates. All of the organic phase was collected and washed with a second portion of water (about 4.1 kilograms), and the organic phase fed to the centrifuge a second time. All of the organic phase was collected and washed with a third portion of water (about 4.1 kilograms), and the organic phase fed to the centrifuge a third time. For each set of conditions the organic phase was analyzed by ion chromatography for sodium, HEG and PEG (pentaethylguanidinium chloride, a decomposition product of HEG); duplicate analyses were run on the same sample. Conditions and analyses are summarized in Table 1. In each case the data are reported vs. polymer rather than vs. the entire mixture. The centrifuge employed had a maximum rating of 10,000 rpm.

Detailed Description Text (21):
A polyetherimide was prepared in o-dichlorobenzene through the reaction of bisphenol A disodium salt and 1,3-bis[N-4-chlorophthalimido]benzene in the presence of hexaethylguanidinium chloride catalyst (HEG). The acid-quenched polymer solution was diluted with ortho-dichlorobenzene to 10% polymer solution, and 881 grams of solution was placed in a 2 liter vessel fitted with an overhead condenser, a thermometer, a nitrogen inlet, an extra port for addition of reagents and a bottom drain valve. The solution was heated to 95.degree. C. and 432 grams of deionized water was added maintaining the temperature of the mixture in a range of about 93-96.degree. C. The solution was stirred for 15 minutes at 170 rpm after which stirring was discontinued. Separation of the phases was complete in two hours. The organic layer was turbid and most of the rag material came in the organic phase. Polymer film formed at the top of aqueous layer. The two phases were well separated at the boundary.

Detailed Description Text (27):
A polyetherimide-containing mixture similar to that used in Example 1 and containing about 800 ppm soluble ionic chloride in the form of hexaethylguanidinium chloride was quenched at about 43.degree. C. with anhydrous hydrochloric acid, and diluted to about 5% solids (wt. polymer/wt. polymer+wt. solvent) through addition of more o-dichlorobenzene. The mixture was treated with silica gel (60-200 mesh;

0.5 grams per 10 g. of polymer in solution) and stirred at 60.degree. C. The mixture was filtered and the filtrate analyzed for soluble ionic chloride by titration. The soluble ionic chloride value was 75 ppm based on polyetherimide.

Detailed Description Text (50):
A polyetherimide was prepared in o-dichlorobenzene through the reaction of bisphenol A disodium salt and 1,3-bis[N-4-chlorophthalimido]benzene in the presence of hexaethylguanidinium chloride catalyst (HEG). The polymer-containing mixture was quenched at a temperature between 150.degree. C. and 180.degree. C. with phosphoric acid and diluted to about 10% solids (wt. polymer/wt. polymer+wt. solvent) through addition of more o-dichlorobenzene. The polyetherimide-containing solution was treated at 90.degree. C. with 300 milliliters water (6.6 wt. % versus polyetherimide; 0.65 wt. % versus 10% polyetherimide-containing solution) and stirred for 7 minutes at 112 rpm, the 1 minute at 160 rpm. The mixture was allowed to settle for 15 minutes at 90.degree. C. then filtered once through steelwool and once through a 5 micrometer cartridge filter. Sodium was analyzed by ion selective electrode, and HEG and PEG were analyzed by ion chromatography. Analyses are summarized in Table 16.

Detailed Description Text (58):
A polyetherimide was prepared in o-dichlorobenzene through the reaction of bisphenol A disodium salt and 1,3-bis[N-4-chlorophthalimido]benzene in the presence of hexaethylguanidinium chloride catalyst (HEG). The polymer-containing mixture was quenched with phosphoric acid and diluted to about 10% solids (wt. polymer/wt. polymer+wt. solvent) through addition of more o-dichlorobenzene. A portion of the polyetherimide-containing solution was treated at 90.degree. C. with 5 milliliters water (3.3 wt. % versus 10% polyetherimide-containing solution) and stirred for 1 minute at 450 rpm. The water was removed by distillation at about 180.degree. C., after which the solution was filtered through a 5 micrometer cartridge filter to give an organic solution containing 500 ppm sodium. The organic solution was then washed three times with 15-20 ml. water (with 0.5-1 hour settling time for each wash before separating the layers) to give an organic solution containing 450 ppm sodium. Sodium was analyzed gravimetrically as sodium chloride following ashing to remove other species.

Detailed Description Text (70):
A polyetherimide was prepared in o-dichlorobenzene through the reaction of bisphenol A disodium salt and 1,3-bis[N-4-chlorophthalimido]benzene in the presence of hexaethylguanidinium chloride catalyst (HEG). A 150 gram portion of the polymer-containing mixture was quenched with 2 ml. acetic acid and diluted to about 10% solids (wt. polymer/wt. polymer+wt. solvent) through addition of more o-dichlorobenzene. The polyetherimide-containing solution was treated at 90.degree. C. with 0.5 milliliters water and stirred for 1 minute at 450 rpm. The mixture was filtered to give an organic solution containing 42 ppm sodium, 2488 ppm HEG, and 245 ppm PEG. The organic solution was then washed three times with 20 ml. water (with 1-2 hour settling time for each wash before separating the layers) to give an organic solution containing 14 ppm sodium, 798 ppm HEG, and 104 ppm PEG. Sodium was analyzed by ion selective electrode.

Detailed Description Text (74):
A polyetherimide was prepared in o-dichlorobenzene through the reaction of bisphenol A disodium salt and 1,3-bis[N-4-chlorophthalimido]benzene in the presence of hexaethylguanidinium chloride catalyst (HEG). A portion of acid-quenched polymer-containing mixture at 15% solids level was treated at 90.degree. C. several times with various amounts of water each time stirring the mixture for 3 minutes at 250 rpm. Table 20 shows the results of the water extractions. Sodium was analyzed by ion selective electrode.

Detailed Description Text (84):
A polyetherimide was prepared in o-dichlorobenzene through the reaction of

bisphenol A disodium salt and 1,3-bis[N-4-chlorophthalimido]benzene in the presence of hexaethylguanidinium chloride catalyst (HEG). A portion (100 grams) of acid-quenched polymer-containing mixture at 15% solids level was treated with 3 milliliters of water and slowly stirred, after which the water was removed by distillation. The mixture was filtered through a 10 micrometer pore size filter to remove agglomerated sodium chloride. The filtrate was stirred twice with water at 90.degree. C. for 3 minutes at 250 rpm. Table 24 shows the results. Sodium was analyzed by ion selective electrode.

CLAIMS:

63. A method for purifying a mixture comprising (i) an aromatic polyetherimide comprising the reaction product of bisphenol A disodium salt and at least one of 1,3-bis[N-(4-chlorophthalimido)]benzene or 1,3-bis[N-(3-chlorophthalimido)]benzene, (ii) hexaethylguanidinium chloride catalyst, (iii) sodium chloride, and (iv) o-dichlorobenzene, comprising the steps of: (a) providing to the mixture an amount of water in a range between about 0.005 wt. % and about 10 wt. % based on weight of polyether, followed by; (b) mixing the phases, wherein a portion of alkali metal halide is in a form that can be separated by a solid separation step following mixing; and (c) subjecting the mixture to at least one solid separation step.

74. A method for purifying a mixture comprising (i) an aromatic polyetherimide comprising the reaction product of bisphenol A disodium salt and at least one of 1,3-bis[N-(4-chlorophthalimido)]benzene or 1,3-bis[N-(3-chlorophthalimido)]benzene (ii) a hexaethylguanidinium chloride catalyst, (iii) sodium chloride, and (iv) o-dichlorobenzene, comprising the steps of: (a) subjecting the mixture to at least one solid separation step, followed by; (b) quenching the mixture with acid; and (c) contacting the organic solution at least once with water and separating the water-containing phase from the organic phase.

77. The method of claim 74 wherein the water phase is treated to recover hexaethylguanidinium chloride catalyst.

79. A method for purifying a mixture comprising (i) an aromatic polyetherimide comprising the reaction product of bisphenol A disodium salt and at least one of 1,3-bis[N-(4-chlorophthalimido) benzene or 1,3-bis[N-(3-chlorophthalimido)]benzene, (ii) a hexaethylguanidinium chloride catalyst, (iii) sodium chloride, and (iv) o-dichlorobenzene, comprising: at least one solid separation step, and at least one ion exchange step, comprising an ion exchange resin.

108. A method for purifying a mixture comprising (i) an aromatic polyetherimide comprising the reaction product of bisphenol A disodium salt and at least one of 1,3-bis[N-(4-chlorophthalimido) benzene or 1,3-bis[N-(3-chlorophthalimido)]benzene, (ii) a hexaethylguanidinium chloride catalyst, (iii) sodium chloride, and (iv) o-dichlorobenzene, comprising the steps of: (a) quenching the mixture with acid, followed by: (b) subjecting the mixture to at least one solid separation step; and (c) contacting the organic solution at least once with water and separating the water-containing phase from the organic phase.

111. The method of claim 108 wherein the water phase is treated to recover hexaethylguanidinium chloride catalyst.

Previous Doc Next Doc Go to Doc#

L18: Entry 2 of 53 File: USPT Nov 29, 2005

DOCUMENT-IDENTIFIER: US 6969693 B2
TITLE: Immobilised ionic liquids

Abstract Text (1):
Ionic liquids are immobilized on a functionalized support which carries or contains one component of the ionic liquid, or a precursor to such a component. The ionic liquid may be immobilized via the anion by treating a support with an anion source, e.g., an inorganic halide, before the ionic liquid is applied or formed. Alternatively, the ionic liquid may be immobilized by having the cation covalently bound to the support, e.g., through silyl groups, or incorporated in the support by synthesizing the support in the presence of a suitable base. The immobilized ionic liquids are of use as catalysts, for example, for the Friedel-Crafts reaction, such as alkylation reaction.

Brief Summary Text (1):
The present application relates to immobilised ionic liquids, and the use of these substances as catalysts in organic synthesis, refinery chemistry and petrochemistry.

Brief Summary Text (2):
It has been known since the early 80's that salts consisting of large organic cations and large, usually inorganic, anions may exhibit very low melting points. The chemical and physical properties of such ionic liquids can be varied over an extremely wide range. Thus the melting point, solubility in various solvents, solvent properties of the pure ionic liquid, viscosity and Lewis acidity can be specifically changed by changes to the components or the molar ratio of the components. The use of these salts optionally referred to as "molten salts" or "ionic liquids" as catalysts was reported back in 1986 by Wilkes et. al. in J. Org. Chem., 186, 51, 480-483. Ionic liquids whose anionic part is formed by excess Lewis acid metal salt, such as aluminium chloride, have proved active catalysts for Lewis acid catalysed reactions such as Friedel-Crafts reactions.

Brief Summary Text (3):
The use of ionic liquids in Friedel-Crafts reactions, especially in alkylation reactions, for example in the preparation of linear alkylbenzenes, has been disclosed in U.S. Pat. No. 5,731,101 and WO 95/21806. The aluminium chloride still used in the industry in large quantities, in pure form or as a benzene complex referred to as "red oil", has to be disposed of in an increasingly costly way due to more stringent environmental measures. Finding a replacement for such catalyst systems is therefore important from the economic and ecological point of view.

Brief Summary Text (4):
The immobilisation of catalytically active liquids on solid supports is verified in the literature and art by a large number of examples. The background to this process is largely the desire to transfer the catalytic properties of a homogeneous catalyst to a heterogeneous catalyst by immobilisation. The advantages of immobilisation lie in simplified separation, recovery and regeneration of the catalyst, low product contamination and synergistic effects produced by the support.

Brief Summary Text (5):
Immobilised ionic liquids are known from EP-A-0 553 009 and U.S. Pat. No. 5,693,585. Both these references describe how a calcined support is impregnated with an ionic liquid consisting of aluminium chloride and an alkylated ammonium chloride or imidazolium chloride in order to prepare an immobilised ionic liquid. The immobilised ionic liquids are used as catalysts in alkylation reactions.

Brief Summary Text (7):
A completely different method of immobilisation was developed by Carlin et al in Chem. Comm., 1997, 1345-1346 and Proc.-Electrochem. Soc., 1998, 98-11, 180-186. Here an ionic liquid used as solvent for a nickel or palladium catalyst is dissolved in a perfluorinated polymer. A membrane in which the ionic liquid is immobilised is obtained by cooling the melt in a pan-type vessel. The recognisable disadvantage of this method is the high sensitivity to organic solvents and elevated temperatures. The melting point of the polymer is approx. 75.degree. C.

Brief Summary Text (8):
The problem was to develop a catalyst system combining the various application possibilities of ionic liquids and the advantages of a heterogeneous catalyst. At the same time, the disadvantages of the methods known from the literature for the immobilisation of ionic liquids should be addressed by developing a method which, if possible, both allows the use of structured supports and also facilitates the immobilisation of weak Lewis acid metal halides.

Brief Summary Text (9):
We found that these problems were overcome by forming a functionalised support prior to formation of the ionic liquid, or prior to contact with the ionic liquid. This method allows the preparation of catalyst systems which, despite their immobilisation on a support material, exhibit in their composition the varied possibilities of pure ionic liquids.

Brief Summary Text (12):
The ionic liquid can be any conventional ionic liquid. Typically, they are classified as fused salt compositions that are liquid at a temperature below the melting point of the individual components. Preferably, the melting point of the ionic liquids as used in the present invention is between -10.degree. C. and 100.degree. C., more preferably -10.degree. C. and 60.degree. C., and most preferably 0.degree. C. to -30.degree. C., all at atmospheric pressure.

Brief Summary Text (13):
Conventional ionic liquids are typically formed by combining an inorganic halide and an organic base. While other anion sources, e.g. inorganic or organic sulphonic acids, may be used, inorganic halides are preferred. Suitable halides are those compounds that can form anions containing polyatomic halide bridges in the presence of a hydrocarbyl containing amine hydrohalide salt. Preferably, the halides are covaiently bonded halides of metals of Groups 8 to 14 of the Periodic Table. Preferred metals are aluminium, boron, gallium, iron, copper, zinc, tin, and indium, with aluminium being most preferred. Examples of suitable metal halides include copper monochloride, ferric trichloride, zinc dichloride and aluminium trichloride.

Brief Summary Text (14):
Organic bases suitable for forming conventional ionic liquids include hydrocarbyl-containing amine hydrohalide salts, such as alkyl-containing amine hydrohalide salts based on trimethylamine, ethylenediamine, ethylenetriamine, morpholine, imidazole, guanidine, picoline, piperazine, pyridine, pyrazole, pyrrolidine, triazine, triazole, pyrimidine, derivatives of such molecules, and/or mixtures thereof, and phosphonium compounds.

Brief Summary Text (15):

As is known in the art, various ratios of inorganic halide to organic base can be used to make the conventional ionic liquids. Stoichiometric amounts of base and inorganic halide are defined such that a neutral ionic liquid is obtained. If the supported ionic liquid of the invention is to be used as a catalyst in subsequent alkylation reactions, the final ionic liquid is preferably acidic.

Brief Summary Text (16):
Ionic liquids that can be used in the process of the invention include chloroaluminates (such as the salts obtained by combining AlCl.sub.3 and an organic base), chlorogallates (based on, e.g. GaCl.sub.3) and mixed ionic liquids e.g. based on three or more ions, e.g. a cation and two or more anions, or an anion and two or more cations, e.g. ternary ionic liquids derived from AlCl.sub.3 and (alkyl) imidazolium chloride and (alkyl)pyridinium chloride, or derived from AlCl.sub.3 and a hydrocarbyl substituted quaternary ammonium halide and a hydrocarbyl-substituted phosphonium halide.

Brief Summary Text (20):
The formation of a functionalised oxidic support has been described by Jones et al. in Nature, 1998, 393, 52-54, and by Brunel et al. in Stud. Surf. Sci. Catal., 1995, 173-180. In these cases, however, an attempt was for the most part made to bond a catalyst successfully used in homogeneously catalysed reactions to the surface of a support, for the most part a molecular sieve or mesoporous material. In contrast, in the present invention, the organic molecule, however, is only part of the actually catalytically active component. Only by adding the inorganic component is an environment created which corresponds to covering the surface with an ionic liquid.

Brief Summary Text (23):
Where the support is contacted with a water-sensitive material, such as AlCl.sub.3, before, during or after forming the functionalised support, the support should be dry. Such dried supports can be obtained by any suitable technique, e.g. calcination, desiccation, and the like. Depending on the chemical structure of the support, calcining may be the preferred way of drying the support. Supports based on silica, alumina, aluminosilicate, such as zeolite and mesoporous materials of the MCM type, and the like, are preferably dried by calcination. The calcination temperature is not critical, and what temperatures can be applied will again depend on the chemical structure of the support. Typically, calcination is performed at temperatures in the range of 300 to 650.degree. C., preferably 450 to 600.degree. C., for 1 to 12 hours, preferably 1 to 6 hours, for example about 3 hours, in order to render supports suitable for use according to the invention. To keep the supports dry, they should be stored in an inert atmosphere.

Brief Summary Text (31):
The amount of ionic liquid used for impregnating the treated support will also depend on the support used and the amount of pretreatment agent on the support, as is explained in more detail below. Good results were obtained in processes where an excess of ionic liquid was used, in particular where the weight ratio of ionic liquid to support was chosen from 2:1 to 1:2. Preferably, so much ionic liquid is used that, after stirring for 0.5 hour, some unabsorbed ionic liquid can still be seen on the surface of the support. If an excess of ionic liquid is used, the excess is preferably removed to avoid leaching of ionic liquid upon use of the supported catalyst formed. Suitably the excess ionic liquid is removed by Soxhlet extraction with refluxing methylene chloride. The ionic liquid so removed can be reused for the impregnation of fresh support.

Brief Summary Text (35):
If a conventional impregnation technique is used, i.e. without any pre-treatment to form a functionalised support in accordance with the present invention, the ionic liquid will react with the reactive groups of the support, with the formation of HCl. In this case, however, an ionic liquid is present and the HCl that is formed

will have super-acidic properties, as is known in the art, see, for instance, "Chemistry of non-aqueous solutions: Current progress" Chapter 5 of R. T. Carlin, J. S. Wilkes, Ed. G. Mamantov, I. Popov, "Chemistry and Speciation in Chloroaluminate Molten Salts" Wiley-VCH, N.Y., 1994, pp. 277-306. Hence, conventional impregnation techniques are expected to result in the formation of super-acidic HCl whereas this is prevented in the process of the invention. In the case of structured/ordered supports, such as zeolites and MCM-type materials, super-acidic HCl typically was found to destroy the support material. Accordingly, conventional impregnation processes result in (partially) destroyed supports, while in the process according to the invention this is not the case, or at least is the case to a lesser extent. Furthermore, the inorganic halide now attached to the support, particularly when it is covalently bonded to the support, will become part of the ionic liquid when the ionic liquid is absorbed on and into the support. This, together with the fact that the structure of the support is not damaged, is believed to be the reason why the supported ionic liquid according to the invention shows less leaching of the ionic liquid than conventional supported ionic liquids do when used in subsequent processes.

Brief Summary Text (41):
Should it not be possible to form the desired anion from a halide already present and a neutral metal halide by simple reaction, the anion can be introduced by an ion exchange. This is the case for example with tetrafluoroborate and hexafluorophosphate anions. Here a simple salt of the anion is added in a suitable solvent and passed over the functionalised support at room temperature until analysis confirms complete exchange of the anions. Selection of the solvent, analysis and conditions of the ion exchange may be specifically selected as a function of the salt used.

Brief Summary Text (45):
The catalyst systems obtained in accordance with the above description may be used in a large number of organic reactions, such as alkylation, acylation or carbonylation reactions, e.g. of aromatics or olefins; addition; elimination; nucleophilic substitution; oxidation or fluorination reactions.

Brief Summary Text (47):
The potential use of the immobilised ionic liquids as catalysts corresponds to the potential applications of the corresponding ionic liquids, with the advantage that the ionic liquid is less liable to leach from the supports than from immobilised ionic liquids prepared simply by impregnating a support that had not been functionalised with an ionic liquid. Hence, the supported ionic liquids of the invention have a longer catalyst life and lead to lower contamination of the product stream than conventional supported ionic liquids.

Brief Summary Text (50):
Whilst the pressure is preferably atmospheric, this is not absolutely necessary; the procedure can be carried both at higher pressures and at partial vacuum. The catalyst load expressed by the WHSV can be varied in a range of 0.1 to 50 h.sup.-1 ; a WHSV between 1 and 20 h.sup.-1 is preferred. As with all other reaction conditions, this must be decided as a function of the reaction.

Detailed Description Text (6):
3.52 ml (39 mmol) benzene was alkylated with 0.88 ml (3.9 mmol) dodecene using 0.29 g of the immobilised ionic liquid as catalyst by heating the mixture with stirring for 1 hour to 80.degree. C. in a Schlenk flask with reflux condenser. A 92% dodecene conversion was achieved with a selectivity of 76% to the monoalkylated product.

Detailed Description Text (15):
6.25 ml benzene (70 mmol) was alkylated with 1.5 ml (7 mmol) dodecene using 0.05 g of the immobilised ionic liquid as catalyst by heating the mixture with stirring

for 1 hour to 40.degree. C. in a Schlenk flask with reflux condenser. A 98.9% dodecene conversion was achieved with a selectivity of 99.5% monoalkylated product.

Detailed Description Text (17):
1.96 g (21 mmol) phenol was alkylated with 0.48 ml (2 mmol) dodecene using 0.14 g of the immobilised ionic liquid of Example 3 as catalyst by heating the mixture with stirring for 1 hour to 180.degree. C. in a Schlenk flask with reflux condenser. A 62% dodecene conversion was achieved with a selectivity of 28% ether product (2-phenoxy dodecane) and 50% alkylation product (2-(4-hydroxyphenyl) dodecane).

Detailed Description Text (19):
1.54 g (12 mmol) naphthalene was alkylated with 1.33 ml (6 mmol) dodecene using 0.15 g of the immobilised ionic liquid of Example 3 as catalyst by heating the mixture with stirring for 1 hour to 80.degree. C. in a Schlenk flask. A 96% dodecene conversion was achieved with a selectivity of 77% to the monoalkylated product.

Detailed Description Text (23):
4.9 ml (45 mmol) anisole, 0.85 ml (9 mmol) acetic anhydride and 0.1 g of the immobilised ionic liquid as catalyst were heated with stirring for 1 hour to 100.degree. C. in a Schlenk flask with reflux condenser. The acetic anhydride conversion was 18.5% a selectivity of 98.4% to 4-methoxy-acetophenone.

Detailed Description Text (28):
Benzene was alkylated with dodecene in a steel reactor of 100 mm length and 6 mm diameter heated in a silicone oil bath to 40.degree. C. using 0.4 g (12 mmol) of the immobilised ionic liquid as catalyst. A solution containing 41 g benzene and 9 g dodecene was pumped through the reactor at a WHSV of 7 h.sup.-1. After a reaction time of 8 hours the catalyst still showed activity. A 88% dodecene conversion was achieved, with a 100% selectivity to the monoalkylated product.

Detailed Description Text (34):
3.61 ml benzene (40 mmol) was alkylated with 0.9 ml (4 mmol) dodecene using 0.3 g of the immobilised ionic liquid as catalyst by heating the mixture with stirring for 1 hour to 80.degree. C. in a Schlenk flask with reflux condenser. A 74% dodecene conversion was achieved with a selectivity of 82% to the monoalkylated product.

Detailed Description Text (42):
A coiled tubular reactor (diameter of the tube 6 mm, length 100 cm) with a frit near the downstream end carrying 1 g of the supported ionic liquid as a catalyst was placed in an oven. At a temperature of 150.degree. C., and with a weight hourly space velocity (WHSV) of 4h.sup.-1, toluene was alkylated with 1-hexene. The process was conducted as a continuous gas phase reaction using a molar ratio of toluene to hexene of 10:1. The conversion, based on 1-hexene, dropped from 86% at the beginning of the reaction to around 45% after 3 hours. Thereafter, the conversion remained at the 45% level. A selectivity ranging from 65 to 85% was observed for the monoalkylated product. The other product was a mixture of hexene isomers and di-, or higher, alkylated products.

Other Reference Publication (1):
Brunel, Daniel et al. "MCM-41 type silicas as supports for immobilized catalysts" Stud. Surf. Sci. Catal., vol. 97 (1995) 173-180.

Other Reference Publication (2):
Boon, Jeffrey et al. "Friedel-Crafts Reactions in Ambient-Temperature Molten Salts" J. Org. Chem., vol. 51 (1986) 480-483.

Other Reference Publication (4):
Jones, Christopher W. et al. "Organic-functionalized molecular sieves as shape-selective catalysts" Nature, vol. 393 (May 7, 1998) 52-54.

Other Reference Publication (6):
Carlin, Richard et al. "Chapter 5: Chemistry and Speciation in Room-Temperature Chloroaluminate Molten Salts" from Chemistry of Nonaqueous Solutions Current Progress, ed. Mamantov et al., VCH Publishers, New York (1994) pp. 277-306.

Other Reference Publication (12):
R.S. Shelton et al., "Non-Acylated Quaternary Ammonium Salts from Aliphatic Amines", J. Am. Chem. Soc., 68, 1946, pp. 753-755.

Other Reference Publication (14):
H.E. Weaver et al., "Properties of Electrolytic Solutions. XXXII. Conductance of Some Long Chain Salts in Ethylene Chloride and Nitrobenzene at 25.degree..sup.1 ", J. Am. Chem. Soc. 1948, vol. 70, pp. 1707-1709.

Other Reference Publication (19):
C. Damas et al., "Synthesis and Behaviour Study of Amphiphilic Polyvinylimidazolium Salts in Aqueous Media: Effects of the Microdomains on a Biomolecular Reaction Involving Hydrophobic Reactants", Eur. Polym. J., vol. 30, No. 11, 1994, pp. 1215-1222.

Other Reference Publication (21):
J.A. Cella et al., "The Relation of Structure and Critical Concentration to the Bacterial Activity of Quarternary Ammonium Salts", J. Am. CHem. Soc. 1952, vol. 74, pp. 2061-2062.

Other Reference Publication (29):
P. Bonhote et al., "Hydrophobic, Highly Conductive Ambient-Temperature Molten Salts", Inorg. Chem. vol. 35, 1996, pp. 1168-1178.

Previous Doc Next Doc Go to Doc#

L23: Entry 1 of 28 File: USPT Aug 30, 2005

DOCUMENT-IDENTIFIER: US 6936619 B2
TITLE: Quinazolinone compounds useful in therapy

Brief Summary Text (39):
(i) an acyl chloride derivative of acid (IV)+amine, with an excess of acid acceptor in a suitable solvent, or

Brief Summary Text (42):
acid chloride of acid (IV) (generated in-situ), an excess of amine, optionally with an excess of 3.degree. amine such as Et.sub.3 N, Hunig's base or NMM, in DCM or THF, without heating for 1 to 24 hrs, or

Brief Summary Text (44):
The preferred conditions are: acid chloride of acid (IV) (generated in-situ), 3.6 eq. amine, in DCM at r.t. for 1 hr.

Brief Summary Text (66):
Step q: The alcohol (XXII) (when Prot is Boc, the alcohol may be obtained as described in WO 02/053558) may be chlorinated to provide the chloride (XXIII) using standard methodology, but preferably under non-acidic conditions. Preferred conditions are: 1.2 eq. MeSO.sub.2 Cl, and 1.5 eq. Et.sub.3 N, in tetrahydrofuran for 30 mins, followed by 1.5 eq. Bu.sub.4 NCl, at r.t. for about 2 hours.

Brief Summary Text (67):
Step (r): The chloride (XXIII) is reacted with an amine (R.sup.5 R.sup.6 NH) or N-linked Het, in the presence of a suitable base (e.g. alkali metal hydride, such as NaH or LiH) in a suitable solvent (e.g. ether, tetrahydrofuran) at between room temperature and reflux for up to 18 hours to provide compounds of formula (XVIII). Preferred conditions are: 1.05 eq. NaH, 1.1 eq. amine/N-linked Het, in tetrahydrofuran at between r.t. and reflux for 18 hrs. ##STR15##

Brief Summary Text (107):
Step (oo) The acyl guanidine (LXXI) may be prepared by using either

Brief Summary Text (108):
(i) the acid chloride of acid (LXIX) and the anion of the guanidine (LXX) prepared in situ, in the presence of a base such as K.sup.t BuO, NaOH, K.sub.2 CO.sub.3 or Cs.sub.2 CO.sub.3 in a suitable solvent e.g. DMF, or

Brief Summary Text (109):
(ii) the acid (LXIX) with a conventional coupling agent such as CDI or DCC and the guanidine (LXX), in the presence of base such as caesium carbonate in a suitable solvent e.g. DMF.

Brief Summary Text (111):
(i) acid chloride of acid (LXIX) (generated in-situ), an excess of guanidine (LXX), with an excess of base such as K.sup.t BuO or NaH, in DMF, without heating for 1 to 24 hrs, or

Brief Summary Text (112):

(ii) acid (LXIX), CDI, an excess of guanidine (LXX), with an excess Cs.sub.2 CO.sub.3 in DMF, at room temperature for 12 to 48 hrs.

Brief Summary Text (113):
Step (pp) Cyclisation of the acyl guanidine (LXXI) to give compound (I) is accomplished by reaction in the presence of a suitable base such as NaOH or K.sup.t BuO in a suitable high boiling solvent such as 3-methyl-pentan-3-ol or ethylene glycol

Brief Summary Text (115):
The guanidine (LXXI) with excess potassium t-butoxide in 3-methyl-pentan-3-ol under reflux for 1 to 24 hours

Brief Summary Text (119):
Step (qq) Compound (LXXIII) can be prepared from compounds (LXXII) and (III) by mixing them with a suitable transition metal salt such as mercury (II) chloride or silver chloride in the presence of an excess of tertiary amine base such as Hunig's base or triethylamine in a suitable solvent such as dichloromethane for 1 to 24 hours Preferred conditions are; 1.2 eq. of compound (LXXII) 1.2 eq. mercury (II) chloride, 3 eq. triethylamine in dichloromethane for 16 hours.

Brief Summary Text (128):
The 2,6-difluoro-4-methoxybenzoic acid (Mol. Cryst. Liq. Cryst. 1989; 172; 165) (2.09 g, 11.1 mmol) was suspended in dichloromethane (110 mL) and a few drops of N,N-dimethylformamide was added followed by oxalyl chloride (2.79 g, 22.2 mmol). The reaction mixture was stirred for 45 minutes at room temperature, after which time a clear homogeneous solution had formed. The reaction mixture was concentrated under reduced pressure and redissolved in dichloromethane (100 mL). The reaction mixture was then added slowly to an ice-cold solution of amino-2-methylpropanol (3.56 g, 40 mmol), in dichloromethane (50 mL). After stirring at room temperature for 1 hour, the reaction mixture was washed with water (75 mL), 0.2N hydrochloric acid (50 mL), dried (MgSO.sub.4) and concentrated under reduced pressure to give the title compound as a white solid (2.77 g, 96%).

Brief Summary Text (133):
To a solution of the alcohol from preparation 1 (2.75 g, 10.6 mmol) in anhydrous dichloromethane (50 mL) was added thionyl chloride (1.43 g, 12 mmol) and the reaction stirred for 1.5 hours at room temperature. The reaction mixture was poured into 1M sodium hydroxide solution (50 mL) and extracted with dichloromethane (2.times.50 mL). The combined organic solutions were dried (MgSO.sub.4) and concentrated under reduced pressure. The residue was purified by column chromatography on silica gel (eluting with dichloromethane:methanol 96:4) to give the title compound as a clear oil (2.40 g, 94%).

Brief Summary Text (143):
To a solution of cyclobutyl chloride (5.64 g, 62 mmol) in anhydrous tetrahydrofuran (60 mL) was added magnesium turnings (1.56 g, 65 mmol) followed by a crystal of iodine, at room temperature. The mixture was stirred at room temperature for 1 hour, followed by a further hour under reflux. A solution of the fluoro compound from preparation 2 (7.23 g, 30 mmol) in tetrahydrofuran (80 mL) was cooled in an ice-bath to 0.degree. C., and the grignard solution (40 mL) was added dropwise over 15 minutes, the cooling bath was removed and reaction warmed to room temperature and stirred for 2 hours. Further grignard solution (10 mL) was added and the reaction stirred for a further 30 minutes. The reaction was poured into a solution of ethylenediaminetetraacetic acid disodium salt (12 g) in 1N sodium hydroxide (100 mL), and the mixture extracted with ethyl acetate (1.times.200 mL, 2.times.100 mL). The combined organic extracts were dried (MgSO.sub.4) and evaporated under reduced pressure, to afford the title compound as a pale yellow oil, 8.31 g.

Brief Summary Text (148):

Cyclohexylmagnesium chloride (22 mL, 2M in diethyl ether, 44 mmol) was added slowly to an ice-cooled solution of the compound from preparation 2 (9.64 g, 40 mmol) in tetrahydrofuran (100 mL), and the solution then stirred at room temperature for 2 hours. Water (10 mL) was added, the mixture poured into ethyl acetate, and washed with a solution of ethylenediaminetetracetic acid disodium salt (24 g) in water (200 mL), then 1N sodium hydroxide solution (100 mL) and brine. The organic solution was dried (MgSO.sub.4) and evaporated under reduced pressure to afford the title compound as a colourless oil, 12.4 g.

Brief Summary Text (243):
The compound from preparation 23 (20.0 g, 52 mmol) was dissolved in N,N-dimethylformamide (120 mL) under nitrogen gas. Zinc cyanide (6.15 g, 52 mmol), lithium chloride (2.22 g, 52 mmol) and tetrakis(triphenylphosphine)palladium (0) (2.42 g, 2.1 mmol) were added and the mixture heated at 110.degree. C. for 8 hours. The reaction mixture was concentrated under reduced pressure, and the residue partitioned between dichloromethane (500 mL) and saturated sodium bicarbonate solution (250 mL). The aqueous phase was re-extracted with dichloromethane (300 mL). The combined organic solutions were dried (MgSO.sub.4) and concentrated under reduced pressure to give a golden oil. The crude product was purified by column chromatography on silica gel using n-pentane:ethyl acetate (90:10) as eluant. The product was co-evaporated with dichloromethane (2.times.100 mL) to give the title compound as a colourless oil (13.32 g, 49%).

Brief Summary Text (443):
Dibromoethane (28 .mu.l, 0.33 mmol) was added to a suspension of the zinc in N,N-dimethylformamide (12 mL), and the mixture heated at 50.degree. C. for 4 minutes, then cooled. Trimethylsilyl chloride (54 mg, 0.50 mmol) was added, the mixture again heated at 50.degree. C. for 5 minutes, tert-butyl 4-iodo-1-piperidinecarboxylate (EP 1078928) (2.57 g, 8.25 mmol) added and stirring continued for 5 minutes. A solution of the bromide from preparation 34 (1.0 g, 3.3 mmol) in N,N-dimethylformamide (2.5 mL), tris(dibenzylideneacetone)dipalladium (0) (38 mg, 0.07 mmol) and tri(o-furyl)phosphine (31 mg, 0.13 mmol) were added, and the reaction mixture heated at 60.degree. C. for 1 hour. The cooled mixture was partitioned between dichloromethane (50 mL) and water (20 mL), and the phases separated. The aqueous layer was extracted with further dichloromethane (2.times.50 mL), and the combined organic extracts were dried (MgSO.sub.4), filtered through Arbocel.RTM. and evaporated under reduced pressure. The residual orange oil was purified by column chromatography on silica gel using an elution gradient of dichloromethane:methanol (100:0 to 96:4) to give the title compound, as an oil, 1.0 g.

Brief Summary Text (448):
A solution of the protected amine from preparation 65 (990 mg, 2.43 mmol) in dry dichloromethane (30 mL) was cooled in an ice/acetone bath and hydrogen chloride gas bubbled through, until saturation. The solution was stirred for a further 2 hours, then evaporated under reduced pressure to afford the title compound as a cream foam, 924 mg.

Brief Summary Text (463):
Triethylamine (0.36 mL, 2.6 mmol), followed by methanesulphonyl chloride (0.22 mL, 2.9 mmol) were added to an ice-cold solution of the alcohol from preparation 37 (600 mg, 2.4 mmol) in dichloromethane (6 mL), and the solution stirred at room temperature for 3 hours. The mixture was evaporated under reduced pressure, and the residue re-dissolved in tetrahydrofuran (6 mL). Pyrrolidine (0.99 mL, 11.9 mmol) was added, and the reaction stirred at room temperature for 18 hours. The mixture was partitioned between dichloromethane (50 mL) and water (50 mL), the layers separated and the organic phase dried (MgSO.sub.4) and evaporated under reduced pressure. The residual yellow oil was purified by column chromatography using an elution gradient of dichloromethane:methanol:0.88 ammonia (98:2:0.2 to 95:5:0.5) to afford the title compound, 600 mg.

Brief Summary Text (468):
Diisopropylethylamine (388 mg, 3 mmol) was added to an ice-cold solution of the alcohol from preparation 37 (530 mg, 2 mmol) in dichloromethane (10 mL). Methanesulphonyl chloride (267 mg, 2.33 mmol) was added, and the reaction stirred at room temperature for 1 hour. 2-Methoxyethylmethylamine (890 mg, 10 mmol) was added and the reaction stirred at room temperature for a further 18 hours. The mixture was poured into water, then extracted with dichloromethane (3.times.40 mL), the combined organic extracts dried (MgSO.sub.4) and evaporated under reduced pressure. The crude product was purified by column chromatography on silica gel using an elution gradient of dichloromethane:methanol (100:0 to 97:3) to afford the title compound as a yellow oil, 285 mg.

Brief Summary Text (483):
Triethylamine (305 .mu.l, 2.19 mmol) and methanesulphonyl chloride (185 .mu.l, 2.39 mmol) were added to an ice-cold solution of the alcohol from preparation 37 (500 mg, 1.99 mmol) in dichloromethane (5 mL), and the solution stirred at room temperature for 2 hours.

Brief Summary Text (510):
Thionyl chloride (11.35 mL, 155.6 mmol) was added to a solution of the alcohol from preparation 77 (9.0 g, 38.9 mmol) in dichloromethane (200 mL) over 20 minutes. The solution was then stirred under reflux for 3 hours, and allowed to cool. The mixture was concentrated under reduced pressure and azeotroped with acetonitrile (2.times.) and dried in vacuo, to afford the title compound as a solid, 11.14 g.

Brief Summary Text (515):
Triethylamine (19.55 mL, 140 mmol) was added to a solution of the chloride from preparation 78 (11.12 g, 38.9 mmol) in acetonitrile (150 mL) over 20 minutes, and the reaction heated under reflux for 6 hours. The cooled mixture was filtered, and the filtrate concentrated under reduced pressure. The residual oil was partitioned between dichloromethane (300 mL) and saturated sodium bicarbonate solution (150 mL) and the phases separated. The aqueous layer was extracted with further dichloromethane (2.times.300 mL), and the combined organic extracts dried (MgSO.sub.4) and evaporated under reduced pressure. The crude product was purified by column chromatography on silica gel using an elution gradient of dichloromethane:methanol (100:0 to 95:5) to afford the title compound as an orange solid, 3.62 g.

Brief Summary Text (587):
Hydrogen chloride was bubbled through an ice-cooled solution of the compound from preparation 93 (5.2 g, 24.2 mmol) in dichloromethane (100 mL), and the reaction stirred for 1.5 hours. The solution was purged with nitrogen, then evaporated under reduced pressure to afford the title compound as an off-white solid, 3.67 g.

Brief Summary Text (592):
Hydrogen chloride was bubbled through an ice-cooled solution of the protected amine from preparation 29 (1.17 g, 3.87 mmol) in dichloromethane (35 mL), for 20 minutes. The reaction was then stirred for a further 30 minutes at room temperature and evaporated under reduced pressure to afford the title compound as a white solid, 1.15 g.

Brief Summary Text (651):
Hydrogen chloride gas was bubbled through an ice-cooled solution of the protected amine from preparation 71 (267 mg, 0.91 mmol) in dichloromethane (15 mL), for 10 minutes, and the reaction then stirred for a further 20 minutes at room temperature. The solution was evaporated under reduced pressure, dissolved in methanol (5 mL), and diluted with ethyl acetate (40 mL). The solution was evaporated under reduced pressure to afford the title compound as a buff-coloured solid.

Brief Summary Text (751):
1-Benzyl-3-oxo-piperidine-4-carboxylic acid ethyl ester (10 g, 38.3 mmol) was added to a mixture of dimethyl guanidinium sulphate (4.6 g, 25 mmol) and potassium carbonate (9.28 g, 67 mmol) in methanol and the reaction mixture was stirred at room temperature for 48 hours. The mixture was filtered and the solid obtained was recrystallised from ethanol.

Brief Summary Text (777):
6-Benzyl-2-chloro-5,6,7,8-tetrahydro-[1,6]naphthyridine (129 mg, 0.5 mmol) (See Reference WO9830560 Example 33b) was added to zinc cyanide (58.7 mg, 0.5 mmol), lithium chloride (27 mg, 0.65 mmol) and tetrakis(triphenylphosphine)palladium (0) (35 mg, 0.03 mmol) in N,N-dimethylformamide (3 ml). The mixture was purged with argon and was heated at 100.degree. C. for 17 hours. The reaction mixture was cooled to room temperature and a further quantity of tetrakis(triphenylphosphine) palladium (0) (35 mg, 0.03 mmol) was added and the mixture was heated at 125.degree. C. for 3 hours. The reaction mixture was cooled to room temperature and a further quantity of tetrakis(triphenylphosphine)palladium (0) (35 mg, 0.03 mmol) was added and the mixture was heated at 125.degree. C. for 3 hours. The reaction mixture was cooled to room temperature and was partitioned between ethyl acetate (40 ml) and water (40 ml). The phases were separated and the organic phase was washed with water (3.times.30 ml) dried over magnesium sulphate and evaporated under reduced pressure. The residue was purified by chromatography on silica gel using ethyl acetate in pentane as eluant (33:67) to give the title compound as a brown gum (97 mg).

Brief Summary Text (782):
Anhydrous cobalt chloride (389 mg, 3 mmol) was added to the nitrile from preparation 150 (373 mg, 1.5 mmol) in methanol (10 ml) and the mixture was stirred at room temperature for 10 minutes. Sodium borohydride (567 mg, 15 mmol) was added portionwise over 15 minutes and the reaction mixture was stirred at room temperature for 1.5 hours. 3N Hydrochloric acid (7 ml) was added dropwise over 10 minutes and the mixture was stirred at room temperature for 20 minutes. The solution was neutralised by addition of concentrated aqueous ammonia and the mixture was stirred at room temperature for 72 hours. Silica gel (10 g) was added and the mixture was evaporated under reduced pressure. The residue was purified by chromatography on silica gel using ammonium hydroxide and methanol in dichloromethane as eluant (2:15:85). The material obtained was co evaporated with methanol and then with dichloromethane to give the title compound as a pale brown gum (135 mg).

Brief Summary Text (822):
An ice-cooled solution of the protected amine from preparation 158 (700 mg, 1.72 mmol) in dichloromethane (20 ml) was saturated with hydrogen chloride, and the solution then stirred for 2 hours at 0.degree. C. The reaction mixture was then degassed under nitrogen and evaporated under reduced pressure to afford the title compound as an orange foam (654 mg).

Brief Summary Text (848):
An ice-cooled solution of the compound from preparation 163 (200 mg, 1.0 mmol) in dichloromethane (10 ml) was saturated with hydrogen chloride, and the solution then stirred at room temperature for 1 hour. The mixture was concentrated under reduced pressure and the residue azeotroped with diethyl ether to afford the title compound.

Brief Summary Text (868):
Hydrogen chloride was bubbled through an ice-cooled solution of the protected amine from preparation 167 (23.77 g, 118 mmol) in diethyl ether(591 ml), until saturated, and the solution was stirred for 1 hour at room temperature. The reaction was concentrated under reduced pressure and the residue re-suspended in diethyl ether.

The mixture was stirred for 3 hours and the ether decanted off, the residue was evaporated under reduced pressure. The product was dissolved in ethanol, trifluoroacetic acid (16 ml) added, and the solution evaporated under reduced pressure to afford the title compound.

Brief Summary Text (900):
10% Palladium on activated carbon (800 mg) was added to a solution of the N-benzyl compound from preparation 148 (1.31 g, 4.4 mmol) and ammonium formate (1.39 g, 22 mmol) in methanol (50 ml). The mixture was heated under reflux for 1 hour, cooled to room temperature and then filtered through Arbocel.RTM.. The filter cake was washed with dichloromethane/methanol (50:50, 400 ml) and the combined filtrates were evaporated under reduced pressure. The residue was purified by chromatography on silica gel using methanol and ammonium hydroxide in dichloromethane as eluant (gradient from 3:0.5:97 to 10:1:90). The material isolated was azeotroped with dichloromethane and dried under vacuum. The residue was dissolved in dichloromethane (5 ml) and hydrogen chloride (1M in diethyl ether) was added. The solid formed was isolated by filtration and was dried at 60.degree. C. under vacuum to give the title compound as a pale yellow solid (832 mg).

Brief Summary Text (905):
Methane sulphonyl chloride (140 .mu.l, 1.8 mmol) was added to a solution of the alcohol from preparation 37 (400 mg, 1.5 mmol) and triethylamine (229 .mu.l, 1.6 mmol) in tetrahydrofuran (10 ml) at 0.degree. C. The mixture was warmed to room temperature and was stirred for 3 hours. The solvent was evaporated under reduced pressure and the residue was redissolved in tetrahydrofuran (10 ml) and partitioned between water (50 ml) and dichloromethane (50 ml). The organic layer was separated, dried over magnesium sulphate and evaporated under reduced pressure to give the title compound as an oil (622 mg).

Brief Summary Text (1000):
Triethylamine (305 .mu.l, 2.19 mmol) and methanesulphonyl chloride (185 .mu.l, 2.39 mmol) were added to a solution of the alcohol from preparation 37 (500 mg, 1.99 mmol) in dichloromethane (5 ml), and the solution stirred at room temperature for 3 hours. The mixture was evaporated under reduced pressure and the residue re-dissolved in tetrahydrofuran (5 ml) and 4-methoxypiperidine (J. Chem. Soc. 1984, (4), 737, Example 13) (1 g, 5.98 mmol) added, and the reaction mixture was stirred at room temperature for 18 hours. The mixture was partitioned between dichloromethane (30 ml) and water (30 ml), the layers separated, and the aqueous phase extracted with dichloromethane (30 ml). The combined organic solutions were dried over sodium sulphate and evaporated under reduced pressure to give a brown oil. This was purified by column chromatography on silica gel using an elution gradient of dichloromethane: methanol: 0.88 ammonia (98:2:1 to 96:4:1) to afford the title compound as a yellow gum (350 mg).

Brief Summary Text (1010):
The protected amine from preparation 210 (243 mg, 0.72 mmol) was dissolved in dichloromethane (15 ml) at 0.degree. C. and hydrogen chloride gas was bubbled through the solution for 10 minutes. The solvent was removed under reduced pressure to give the title compound as a white solid (200 mg)

Brief Summary Text (1025):
Mercury (II) chloride (1.29 g, 4.78 mmol) was added to the amine from preparation 191 (0.9 g, 4.34 mmol), triethylamine (1.67 ml, 12 mmol) and 1,3-bis(tert-butoxycarbonyl)-2-methyl-2-thiopseudourea (1.39 g, 4.78 mmol) in dichloromethane (25 ml) and the mixture was stirred at room temperature for 16 hours. The reaction mixture was diluted with dichloromethane and filtered through Arbocel.RTM. and the filtrate was evaporated under reduced pressure. The residue was purified by chromatography on silica gel using ethyl acetate in pentane as eluant (50:50) to give the title compound as a white solid (1.5 g).

Brief Summary Text (1033):
Hydrogen chloride gas was bubbled into a solution of the protected amidine from preparation 220 (1.5 g, 3.34 mmol) in dichloromethane for 10 minutes. The mixture was stirred at room temperature for 1 hour. The solvent was evaporated under reduced pressure to give the title compound as a white solid (1 g).

Brief Summary Text (1057):
Magnesium turnings (2.4 g, 100 mmol) were added to 4-chlorotetrahydropyran (12 g, 100 mmol) in tetrahydrofuran (100 ml) followed by a crystal of iodine. After initiation of the reaction the mixture reached reflux without external heating. When the reaction had subsided, the mixture was stirred at room temperature for 2 hours. The above tetrahydropyran-4-yl magnesium chloride solution (50 ml) was added dropwise to the fluoro compound from preparation 2 (4.82 g, 20 mmol) in tetrahydrofuran (20 ml) at 0.degree. C. and the mixture was warmed to room temperature and was stirred for 2 hours. The reaction mixture was diluted with water and filtered through Arbocel.RTM.. The solution was extracted with ethyl acetate and the organic layer was washed with brine and dried over magnesium sulphate and evaporated under reduced pressure. The residue was purified by chromatography on silica gel using ethyl acetate in dichloromethane as eluant (gradient from 0:100 to 40:60) to give the title compound as a white solid (6.5 g).

Brief Summary Text (1067):
Isopropyl magnesium chloride (2M in tetrahydrofuran, 0.5 ml, 1 mmol) was added dropwise to the fluoro compound from preparation 2 (241 mg, 1 mmol) in tetrahydrofuran (5 ml) at 0.degree. C. The reaction mixture was stirred at 0.degree. C. for 15 minutes and then was stirred at room temperature for 16 hours. The reaction mixture was added to water and the solution was extracted with dichloromethane (3.times.30 ml). The combined organic solutions were dried over magnesium sulphate and evaporated under reduced pressure. The residue was purified by chromatography on silica gel using ethyl acetate in hexane as eluant (gradient from 0:100 to 30:70) to give the title compound as a colourless oil (110 mg).

Brief Summary Text (1107):
A solution of sodium nitrite (3.73 g, 54 mmol) in water (20 ml) was added to the amino compound from preparation 291 (8.3 g, 50 mmol) in concentrated hydrochloric acid at -10.degree. C. at a rate that maintained the temperature below -5.degree. C. The solution was stirred at -5.degree. C. for 1 hour and then was added dropwise to copper (I) chloride (9.9 g, 0.1 mol) in water (100 ml) at -10.degree. C. The reaction mixture was warmed to room temperature and was stirred for 16 hours and then the aqueous mixture was extracted with dichloromethane (.times.3). The combined organic solutions were washed with 1M sodium hydroxide solution (2.times.250 ml) and water (250 ml) then dried over sodium sulphate and evaporated under reduced pressure. The residue was purified by chromatography on silica gel using cyclohexane in dichloromethane as eluant (25:75) to give the title compound as a white solid (6.5 g).

Brief Summary Text (1148):
The quinazolinone from preparation 258 (3 g, 11 mmol) was suspended in acetonitrile (30 ml) and tetraethylammonium chloride (2.1 g, 11 mmol), N'N-dimethylaniline (1.46 ml, 11 mmol) and phosphorous oxychloride (5.35 ml, 57 mmol) were added. The mixture was heated to 75.degree. C. over 20 minutes and then was cooled to room temperature. The mixture was added to ice and then saturated sodium carbonate solution was added to give pH 9. The solution was extracted with dichloromethane containing 5% methanol (.times.3). The combined organic solutions were dried over sodium sulphate and evaporated under reduced pressure. The residue was purified by chromatography on silica gel using methanol in dichloromethane as eluant (gradient from 0:100 to 10:90) to give the title compound as a white solid (1.11 g).

Brief Summary Text (1153):

Antimony (III) chloride (4 g, 17.4 mmol) was added to a suspension of the amino compound from preparation 259 (2.43 g, 8.7 mmol) in dichloromethane (50 ml) and acetonitrile (50 ml) and the mixture was cooled to -10.degree. C. and tert-butyl nitrite (3.6 ml, 30.4 mmol) was added dropwise. The mixture was stirred at -10.degree. C. for 1 hour, at room temperature for 1.5 hours and under reflux for 16 hours. The reaction mixture was cooled to room temperature and was added to ice. The mixture was filtered and the phases were separated. The aqueous phase was extracted with dichloromethane (.times.2) and the combined organic solutions were dried over sodium sulphate and evaporated under reduced pressure. The residue was purified by chromatography on silica gel using ethyl acetate in pentane as eluant (gradient from 5:95 to 15:85) to give the title compound as an off white solid (200 mg).

Brief Summary Text (1198):
The iodo compound from preparation 241 (1 g, 3.6 mmol) was mixed with 2-tributylstannanyl-pyridine (2.66 g, 7.2 mmol), copper (I) iodide (137 mg, 0.72 mmol), lithium chloride (612 mg, 14.2 mmol) and tetrakis(triphenylphosphine) palladium(0) (400 mg, 0.34 mmol) in 1,4-dioxane (25 ml) and the mixture was heated under reflux for 4 hours. The reaction was cooled to room temperature and concentrated ammonium hydroxide solution (5 ml) was added. The solution was partitioned between brine and dichloromethane and the aqueous phase was extracted with dichloromethane. The combined organic solutions were dried over magnesium sulphate and evaporated under reduced pressure. The residue was purified by chromatography on silica gel using ethyl acetate in pentane as eluant (gradient from 50:50 to 100:0) to give the title compound as a pale yellow solid (0.95 g). LRMS: m/z ES.sup.+ 229 [MH.sup.+]

Brief Summary Text (1222):
The guanidine from preparation 225 (121 mg, 0.3 mmol) was suspended in N,N-dimethylformamide (3 ml) and sodium hydride (60% in mineral oil, 60 mg, 1.5 mmol) was added and the mixture was stirred at room temperature for 20 minutes. The carboxylic acid from preparation 285 (80 mg, 0.3 mmol) was suspended in dichloromethane (4 ml) containing 1 drop of N,N-dimethylformamide. Oxalyl chloride (76 mg, 0.6 mmol) was added and the mixture was stirred for 10 minutes. The mixture was evaporated under reduced pressure and the residue was redissolved in dichloromethane (3 ml). The solution obtained was added to the guanidinium salt described above and the mixture was stirred at room temperature for 1 hour and then was acidified with 0.2N hydrochloric acid (50 ml). The solution was washed with dichloromethane (2.times.20 ml) and then basified with 1M sodium hydroxide. The aqueous mixture was extracted with dichloromethane (3.times.70 ml) and the combined extracts were dried over magnesium sulphate and evaporated under reduced pressure. The residue was purified by chromatography on silica gel using methanol and ammonium hydroxide in dichloromethane as eluant (7:1:93) to give the title compound as a glass (78 mg).

Brief Summary Text (1226):
were prepared by a similar method to that of preparation 286 using the carboxylic acid from preparation 285 and the appropriate guanidine.

Brief Summary Text (1234):
Triethylamine (160 .mu.l, 1,16 mmol) and then methane sulphonyl chloride (72 .mu.l, 0.92 mmol) were added to 5-hydroxymethyl-3,4-dihydro-1H-isoquinoline-2-carboxylic acid tert-butyl ester (202 mg, 0.77 mmol) (WO 02053558 p 59) in tetrahydrofuran (20 ml) and the mixture was stirred for 30 minutes. Tetrabutyl ammonium chloride (322 mg, 1.16 mmol) was added and the mixture was stirred for 2 hours at room temperature. The reaction mixture was diluted with ethyl acetate and the organic solution was washed with sodium hydrogen carbonate solution, dried over magnesium sulphate and evaporated under reduced pressure. The residue was purified by chromatography on silica gel using methanol in dichloromethane as eluant (2:98) to give the title compound (100 mg).

Brief Summary Text (1244):
The protected amine from preparation 291 (290 mg, 0.88 mmol) was dissolved in dichloromethane (12 ml) and was cooled to 4.degree. C. under a nitrogen atmosphere. Hydrogen chloride was bubbled into the solution for 10 minutes to give a saturated solution. The reaction mixture was stirred at 4.degree. C. for 2.5 hours and then evaporated under reduced pressure. The residue was purified by chromatography on silica gel using ammonium hydroxide and methanol in dichloromethane as eluant (0.7:7:93). The material obtained was co evaporated with methanol to give the title compound as a pale yellow oil (180 mg).

Brief Summary Text (1292):
A mixture of the chloride from preparation 39 (1.20 g, 4.68 mmol) and N-methylethylamine (2 ml) in dichloromethane (10 ml) was stirred at room temperature for 18 hours, then under reflux for a further 8 hours. Acetonitrile (20 ml) was added, and the reaction stirred under reflux for an additional 24 hours. The cooled mixture was concentrated under reduced pressure and the residue partitioned between dichloromethane and 1% sodium bicarbonate solution. The organic layer was separated, dried over magnesium sulphate, and evaporated under reduced pressure. The crude product was purified by chromatography on silica gel using dichloromethane:methanol (100:0 to 94:6) to afford the title compound as a pale yellow oil, 1.26 g.

Brief Summary Text (1302):
Mercury chloride (11.94 g, 44 mmol) was added to a rapidly stirring solution of 2-methoxyethylamine (3.0 g, 40 mmol), 1,3-bis(tert-butoxycarbonyl)-2-methyl-2-thiopseudourea (11.6 g, 40 mmol) and triethylamine (20.24 g, 200 mmol) in dichloromethane (100 ml), and the reaction stirred at room temperature for 17 hours. The mixture was filtered, the filtrate evaporated under reduced pressure and the residue triturated with hot ethyl acetate to remove further mercury salts. The filtrate was evaporated under reduced pressure and the crude product purified by chromatography on silica gel using cyclohexane:ethyl acetate (95:5 to 85:15) to give the title compound as a colourless oil, 8.2 g.

Brief Summary Text (1312):
Sodium hydride (156 mg, 60% dispersion in mineral oil, 3.9 mmol) was added portionwise to dry ethanol (3.5 ml), and once addition was complete, the guanidine from preparation 305 (621 mg, 1.8 mmol) was added, and the solution heated under reflux for 30 minutes. 4-Amino-1-benzyl-1,2,5,6-tetrahydro-3-pyridinecarbonitrile (J. Med. Chem. 1991; 34 (9); 2899) (213 mg, 1 mmol) was added and the reaction heated under reflux for a further 17 hours. TLC analysis showed starting material remaining, so the cooled reaction was diluted with ethanol (3 ml), additional sodium hydride (10 mg, 60% dispersion in mineral oil, 0.4 mmol) added, and the reaction heated under reflux for a further 24 hours. The cooled mixture was partitioned between water (50 ml) and ethyl acetate (50 ml), the layers separated, the aqueous extracted with ethyl acetate (2.times.35 ml), and the combined organic solutions dried over magnesium sulphate and evaporated under reduced pressure. The residual oil was purified by column chromatography on silica gel using dichloromethane:methanol:0.88 ammonia (97:3:0.2 to 90:10:1) and the product azeotroped with ether to afford the title compound as a yellow solid, 58 mg.

Detailed Description Text (4):
A mixture of the amine hydrochloride from preparation 95 (113 mg, 0.41 mmol), the chloride from preparation 18 (86 mg, 0.34 mmol) and diisopropylethylamine (0.36 mL, 1.7 mmol) in n-butanol (3 mL) was stirred under reflux for 2.5 hours. The cooled reaction mixture was concentrated under reduced pressure and the residue partitioned between dichloromethane (40 mL) and water. The layers were separated, the organic phase washed with brine, dried (MgSO.sub.4) and concentrated under reduced pressure. The crude product was purified by column chromatography on silica gel using dichloromethane:methanol (97:3) as eluant to afford the title compound as

a solid.

Detailed Description Text (13):
A mixture of the chloride from preparation 18 (351 mg, 1.4 mmol) in n-butanol (21 mL), the amine from preparation 106 (335 mg, 1.43 mmol) and N,N-diisopropylethylamine (633 mg, 4.9 mmol) was heated under reflux for 6 hours, then a further 7 hours at room temperature. The resulting precipitate was filtered off, washed with n-butanol, and dried in vacuo. The solid was purified by column chromatography on silica gel using an elution gradient of dichloromethane:methanol (97:3 to 93:7), and the product triturated with ether to afford the title compound as a white solid, 470 mg.

Detailed Description Text (22):
A mixture of the chloride from preparation 18 (302 mg, 1.2 mmol), the amine from preparation 124 (1.23 mmol) and diisopropylethylamine (646 mg, 5 mmol) in n-butanol (10 mL) was heated under reflux for 1.5 hours. The cooled mixture was diluted with water and extracted with dichloromethane (3.times.50 mL). The combined organic extracts were dried (MgSO.sub.4) and evaporated under reduced pressure. The residue was purified by column chromatography on silica gel using an elution gradient of dichloromethane:methanol (100:0 to 90:10) to afford the title compound as an off-white solid, 307 mg.

Detailed Description Text (27):
The title compound was obtained as a yellow solid in 23% yield, from the chloride from preparation 18 and the amine from preparation 136, following a similar procedure to that described in example 26, except dichloromethane:methanol:0.88 ammonia (90:10:1) was used as the column eluant.

Detailed Description Text (32):
The title compound was obtained as a white solid in 45% yield, from the chloride from preparation 18 and the amine from preparation 133, following a similar procedure to that described in example 26.

Detailed Description Text (37):
The title compound was obtained as a white solid in 43% yield, from the chloride from preparation 18 and the amine from preparation 131, following a similar procedure to that described in example 26, except dichloromethane:methanol:0.88 ammonia (95:50.5) was used as the column eluant.

Detailed Description Text (42):
A mixture of the chloride from preparation 18 (0.40 mmol), the amine hydrochloride from preparation 120 (145.6 mg, 0.48 mmol) and triethylamine (223 .mu.l, 1.60 mmol) in n-butanol (6 mL) was heated under reflux for 3 hours. The cooled mixture was concentrated under reduced pressure and the residue partitioned between water (4 mL) with saturated sodium bicarbonate solution (2 mL), and dichloromethane (30 mL), and the layers separated. The aqueous phase was extracted with further dichloromethane (2.times.20 mL), and the combined organic solutions dried (MgSO.sub.4) and evaporated under reduced pressure. The residual solid was purified by column chromatography on silica gel using an elution gradient of dichloromethane:methanol:0.88 ammonia (95:5:0.2 to 90:10:0.6) to afford the title compound as a white solid, 110 mg.

Detailed Description Text (49):
A mixture of the chloride from preparation 18 (80 mg, 0.32 mmol), the amines from preparations 120 and 121 (99 mg), and triethylamine (178.mu.l, 1.28 mmol) in n-butanol (6 mL) was heated under reflux for 3.5 hours. The cooled mixture was concentrated under reduced pressure and the solid residue partitioned between dichloromethane (30 mL) and a solution of saturated sodium bicarbonate (1 mL) in water (5 mL), and the phases separated. The aqueous layer was extracted with dichloromethane (2.times.30 mL), and the combined organic extracts dried

(MgSO.sub.4) and evaporated under reduced pressure. The crude product was purified by column chromatography on silica gel using an elution gradient of dichloromethane:methanol (100:0 to 95:5) to afford the title compound of example 31, 42 mg.

Detailed Description Text (69):
A mixture of the chloride from preparation 18 (60 mg, 0.24 mmol), the amine hydrochloride from preparation 121 (80 mg, 0.30 mmol) and diisopropylethylamine (258 mg, 2 mmol) in n-butanol (4 mL) was heated under reflux for 1.5 hours. The cooled mixture was poured into water and extracted with dichloromethane (3.times.50 mL). The combined organic extracts were dried (MgSO.sub.4) and evaporated under reduced pressure. The residue was purified by column chromatography on silica gel using an elution gradient of dichloromethane:methanol (100:0 to 80:20). The product was re-dissolved in dichloromethane treated with 1 N ethereal hydrochloric acid (2 mL), and the solution evaporated under reduced pressure to afford the title compound as a light brown solid, 60 mg. .sup.1 H-nmr (DMSO-d.sub.6 400 MHz) .delta.: 0.72 (m, 2H), 0.97 (m, 2H), 2.87 (s, 6H), 3.14 (m, 2H), 3.36 (m, 1H), 3.79 (s, 3H), 4.18 (m, 2H), 4.56 (s, 2H), 5.13 (s, 2H), 6.38 (s, 1H), 7.42 (bs, 1H), 8.71 (s, 1H), 10.49 (bs, 1H). LRMS: m/z (ES.sup.+) 407 [MH.sup.+] Microanalysis: Found: C, 54.11; H, 5.94; N, 16.83. C.sub.22 H.sub.26 N.sub.6 O.sub.2 ;2HCl;0.5H.sub.2 O requires C, 54.10; H, 5.98; N, 17.21%

Detailed Description Text (72):
were prepared from the chloride from preparation 18, the appropriate amines and diisopropylethylamine, following a similar procedure to that described in example 40.

Detailed Description Text (76):
A mixture of the chloride from preparation 18 (70 mg, 0.28 mmol), the amine hydrochloride from preparation 129 (66 mg, 0.34 mmol) and triethylamine (113 .mu.l, 1.1 2 mmol) in n-butanol (6 mL) was heated under reflux for 6 hours. The cooled mixture was concentrated under reduced pressure and the residual solid partitioned between water (5 mL) and dichloromethane:methanol (95:5, 50 mL) and the layers separated. The aqueous phase was extracted with dichloromethane:methanol (95:5, 2.times.30 mL), and the combined organic solutions dried (MgSO.sub.4) and evaporated under reduced pressure. The product was purified by column chromatography on silica gel using an elution gradient of dichloromethane:methanol (98:2 to 90:10) to give a white solid. This was suspended in water, diluted with saturated sodium bicarbonate solution, and extracted with dichloromethane (3.times.50 mL). The combined organic extracts were dried (MgSO.sub.4) and evaporated under reduced pressure. The solid was dissolved in dichloromethane:methanol (1:1, 8 mL), 1N ethereal hydrochloric acid added, and the mixture evaporated under reduced pressure to afford the title compound as a foam, 69 mg.

Detailed Description Text (81):
A mixture of the chloride from preparation 18 (140 mg, 0.5 mmol), the amine hydrochloride from preparation 122 (290 mg, 0.84 mmol) and triethylamine (390 .mu.l, 2.8 mmol) in n-butanol (3mL) was heated under reflux for 1.5 hours. The cooled mixture was filtered, the resulting solid washed with n-butanol and diethyl ether, then dried at 60.degree. C. in vacuo, to afford the title compound as a cream solid.

Detailed Description Text (86):
The title compound was obtained as a cream solid in 65% yield, from the chloride from preparation 18 and the amine hydrochloride from preparation 125, following a similar procedure to that described in example 45, except, diisopropylethylamine was used instead of triethylamine.

Detailed Description Text (102):

The chloro compound from preparation 269 (76 mg, 0.3 mmol) was mixed with the naphthyridine from preparation 117 (93 mg, 0.4 mmol) and N,N-diisopropylethylamine (129 .mu.l, 1 mmol) in n-butanol (5 ml) and the mixture was heated under reflux for 2 hours. The reaction mixture was cooled to room temperature and ethyl acetate added. The solution was washed with water and brine then dried over magnesium sulphate. The residue was purified by chromatography on silica gel using methanol in dichloromethane as eluant (gradient from 0:100 to 7:93). The material obtained was dissolved in dichloromethane and ethereal hydrogen chloride (1M, 2 ml) was added. The solvent was evaporated under reduced pressure to give the title compound as on off white solid (73 mg).

Detailed Description Text (111):
The products that were obtained were dissolved in dichloromethane and ethereal hydrogen chloride solution was added. The solvents were evaporated under reduced pressure to give the product as the hydrochloride salt.

Detailed Description Text (116):
Hydrogen chloride gas was bubbled for 10 minutes into a solution of the protected amine from preparation 293 (155 mg, 0.32 mmol) in dichloromethane at 0.degree. C. The solution was stirred at 0.degree. C. for 1.5 hours and then the mixture was degassed by a stream of nitrogen being blown through the mixture. The solvent was evaporated under reduced pressure and the residue was dried under vacuum to give the title compound as a white solid (146 mg).

Detailed Description Text (121):
3-Methylpentan-3-ol (5 ml) was added to the guanidine from preparation 286 (86 mg, 0.2 mmol) and potassium t-butoxide (67 mg, 0.6 mmol) and the mixture was heated under reflux for 1 hour. A further quantity of potassium t-butoxide (45 mg, 0.4 mmol) was added and the mixture was heated under reflux for a further 1 hour. The reaction mixture was cooled to room temperature and 1M citric acid (3 ml) was added. The mixture was added to water and was basified with 0.5M sodium hydroxide solution. The solution was extracted with dichloromethane (3.times.50 ml) and the combined organic solutions were dried over magnesium sulphate and evaporated under reduced pressure. The residue was purified by chromatography on silica gel using methanol and ammonium hydroxide in dichloromethane as eluant (gradient from 0:0:100 to 10:1:90). The material isolated was dissolved in dichloromethane and 1M hydrogen chloride in dichloromethane was added. The mixture was evaporated under reduced pressure to give the title compound as a white solid (26 mg).

Detailed Description Text (126):
The title compound was obtained from the guanidine from preparation 287 in 27% yield following the procedure described in Example 124.

Detailed Description Text (131):
The title compound was obtained from the guanidine from preparation 288 in 27% yield following a similar procedure to that described in Example 124.

Detailed Description Text (136):
Caesium carbonate (450 mg, 1.38 mmol) was added to the guanidine from preparation 224 (177 mg, 0.55 mmol) in N,N-dimethylformamide (2 ml) and the suspension was stirred for 1 hour at room temperature. The imidazolide solution from preparation 280 (3 ml, 0.46 mmol) was added and the mixture was stirred at room temperature for 42 hours. The solvent was evaporated under reduced pressure and the residue was partitioned between ethyl acetate (25 ml) and pH7 buffer (40 ml). The phases were separated and the aqueous solution was extracted with ethyl acetate (2.times.25 ml). The combined organic solutions were washed with brine (3.times.15 ml), dried over magnesium sulphate and evaporated under reduced pressure.

Detailed Description Text (142):
The title compound was obtained from the imidazolide solution from preparation 280

and the guanidine from preparation 223 in 7% yield following the procedure described in Example 127.

Detailed Description Text (164):
The chloro compound from preparation 269 (101 mg, 0.4 mmol) was added to the amine from preparation 110 (104 mg, 0.45 mmol) in n-butanol (5 ml) containing N,N-diisopropylethylamine (129 .mu.l, 1 mmol) and the mixture was heated under reflux for 2 hours. The reaction mixture was cooled to room temperature and the solid formed was isolated by filtration. The material obtained was dissolved in 5% methanol in dichloromethane and ethereal hydrogen chloride (1M, 2 ml) was added. The solvent was evaporated under reduced pressure and the residue was dried under vacuum to give the title compound (176 mg).

Detailed Description Text (169):
The protected amine from preparation 297 (59 mg, 0.12 mmol) was dissolved in dichloromethane (1 ml) and trifluoroacetic acid (1 ml) was added. The reaction mixture was stirred at room temperature for 30 minutes and then the solvent was evaporated under reduced pressure. The residue was purified by chromatography on silica gel using ammonium hydroxide and methanol in dichloromethane as eluant (1:7:93). The material obtained was dissolved in dichloromethane and ethereal hydrogen chloride (1M, 1 ml) was added. The solvent was evaporated under reduced pressure and the residue was dried under vacuum to give the title compound as an off white solid (26 mg).

Previous Doc Next Doc Go to Doc#

Freeform Search

Database: US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Term: guanidinium and chloride and l19

Display: 10 **Documents in Display Format:** CIT **Starting with Number** 1

Generate: ○ **Hit List** ◉ **Hit Count** ○ **Side by Side** ○ **Image**

Search Clear Interrupt

Search History

DATE: Thursday, April 20, 2006 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=USPT; PLUR=YES; OP=ADJ			
L23	guanidinium and chloride and l19	28	L23
L22	guanidinium and l19	29	L22
L21	L19 and hexaethylguanidinium	0	L21
L20	L19 and "recovering guanidine"	1	L20
L19	activated carbon and guanidine	633	L19
L18	L17 and salt	53	L18
L17	L16 and catalyst	66	L17
L16	guanidine and calcination	96	L16
L15	pentaethylguanidine and carbon	1	L15
L14	pentaethylguanidine and sorbent	0	L14
L13	pentaethylguanidine and absorbent	0	L13
L12	pentaethylguanidine and adsorbent	0	L12
L11	pentaethylguanidine and clay	0	L11
L10	pentaethylguanidine and membrane	0	L10
L9	l7 and adsorbent	0	L9
L8	l2 and pentaethylguanidine	0	L8

First Hit Previous Doc Next Doc Go to Doc#

Generate Collection Print

L1: Entry 1 of 2 File: JPAB Oct 2, 2002

PUB-NO: JP02002282647A
DOCUMENT-IDENTIFIER: JP 2002282647 A
TITLE: DEODORANT AND DEODORIZING METHOD

PUBN-DATE: October 2, 2002

INVENTOR-INFORMATION:

NAME	COUNTRY
TEJIMA, HIROSHI	
ITO, KENZO	

ASSIGNEE-INFORMATION:

NAME	COUNTRY
SHISEIDO CO LTD	

APPL-NO: JP2001096404
APPL-DATE: March 29, 2001

INT-CL (IPC): B01 D 53/52; B01 D 53/58; A61 L 9/01; B01 D 53/48; C02 F 1/00; C02 F 11/00

ABSTRACT:

PROBLEM TO BE SOLVED: To provide a method for rapidly eliminating a malodor, which is generated from activated sludge, excess sludge, digested sludge, flocculated sludge or the like generated in wastewater or generated at the time of treatment of wastewater, washing water of a washing device or a mixture of them, by a small amount of a chemical liquid fed into an exhaust duct, and developing lasting effect.

SOLUTION: The deodorizing method is characterized by a liquid deodorizing process for deodorizing exhaust gas, which contains an offensive smell containing at least one of hydrogen sulfide, mercaptans or the like, by a cationic compound represented by a quaternary ammonium salt type compound or a guanidine compound and aqueous hydrogen peroxide. The treated exhaust is further treated with activated carbon or impregnated charcoal.

COPYRIGHT: (C)2002,JPO

Previous Doc Next Doc Go to Doc#

L7	2 and pentaethylguanidine	2	L7
L6	L4 and clorophthalic	0	L6
L5	L4 and phthalic	0	L5
L4	l2 and acid	1	L4
L3	L2 and sodium phenylphosphinate	0	L3
L2	hexaethylguanidinium and charcoal	1	L2
L1	hexaethylguanidinium and clay	17	L1

END OF SEARCH HISTORY

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	18	guanidine and nanofiltration	USPAT; EPO; DERWENT	AND	ON	2006/04/20 17:30